

permit the activity of the Chalcids. From my observations on the emergence of the Chalcids, this is from the latter part of May to the beginning of October, namely, about five months. On the basis of these facts, there is sufficient time for the development of about six broods during the open season; assuming that healthy cocoons are available on the emergence of the adult Chalcids. The cocoons are usually so located under the turf, as to be readily accessible to these small Chalcids, which, on emerging from one cocoon, would soon seek a healthy host. It would seem, therefore, from the study of the parasite and from such evidence as I have been able to collect concerning the history of the prevalence of its host in certain localities, that this species is one of the chief factors in the natural control of *L. erichsonii* wherever the Chalcid occurs.

Summary.

In the observations which were made on the development of the Chalcid *Celopisthia nematocida*, it was found that in the September and October broods the eggs, which are laid on the host larvæ inside the cocoons, hatch in two to three days; the larvæ become full grown in ten to twelve days, and the adults may emerge about twenty-three days after the eggs were deposited. The parasite feeds externally and hibernates as a mature larva inside the cocoon of the host. A number of broods of the parasite occur annually.

ON THE HABITS AND STRIDULATION OF *IDIONOTUS*
BREVIPIES CAUDELL, AND OTHER NOTES
ON ORTHOPTERA.

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Since recording the capture of the northern Dectician, *Idionotus brevipies* Caudell, at Fort William, Ont. (CAN. ENT., XL, p. 209), I visited the same locality again in 1910, and succeeded in finding the insect a second time, on the second and eighth of August.

I found that it is by no means confined to open grassy places, as I had supposed, but occurs also in paths and old lumber roads in the depths of the spruce swamps, which still cover the greater part of the flat country surrounding Fort William and Port Arthur. The tree growth in these swamps consists mainly of black spruce, interspersed with tamarack, white cedar and balsam fir.

With the exception of a single female, which I found squatting close to the ground on a path in the swamp, all the specimens taken were males,

and were all traced by their stridulation. When discovered, they were sometimes found perching in a conspicuous position upon the upper side of a leaf or twig of some shrub, a few feet from the ground, but several times the sound was traced to the trunk of a tree, and the musician was in some cases too high up to be detected. One was seen on the trunk of a black spruce, about twelve feet from the ground, and could just be reached with the net by standing upon a nearby stump.

The stridulation of this grasshopper is a soft trill of little volume, audible at a distance of but a few yards. It is sometimes continuous for some seconds, but is generally interrupted rhythmically, the divisions being produced at a rate varying according to the amount of sunshine. In bright sunshine I counted forty in fifteen seconds, the rate being thus $2\frac{2}{3}$ divisions per second, but on an afternoon when the sun was almost wholly overcast the rate was reduced to forty-one or forty-two in thirty seconds, or about half the rate in sunshine. When close to the stridulating insect I could detect that there were no absolute pauses between the trills, a very low trilling sound filling in all the intervals. The rhythm is not always quite regular. Sometimes after a succession of trills of apparently equal length one may be shortened or lengthened, and then the regular trilling resumed.

All the specimens of this insect seen were of the brachypterous form, with one exception, in which the tegmina and wings were similar to those of the macropterous individual figured on plate 7, CAN. ENT., *loc. cit.*

The stridulation of *Chloealtis abdominalis* Thomas was also heard repeatedly at this locality, and can be fairly well represented by "zip-zip-zip" repeated continuously at a rate varying from five per second (late afternoon sun, nearly overcast), to a little over six per second (bright sunshine). Doubtless the rates in both these cases vary more than these observations show, it being a general rule among the Orthoptera that a lowering of temperature produces a corresponding retardation in the rate of stridulation.

Only one species of Orthoptera was taken in the vicinity of Fort William that was not observed here in 1908. This was *Nemobius fasciatus abortivus* Caudell. The specimens were confined to a small sandy area thinly clothed with grass and weeds. They were very small, and the stridulation was a low continuous trill, differing thus from that of typical *fasciatus*. It is thus possible that this form is specifically distinct.